

### ABSTRACT OF THE DISCLOSURE

A plasma processing system, method, and computer readable medium for measuring plasma impedance. The system includes a chamber configured to contain a plasma and including a chuck within an interior area of the chamber, the chuck including a support surface and a bottom surface, and a first voltage-current probe positioned at a first position located exterior to the chamber and on a radio-frequency transmission line between the chamber and a power source. The system also includes a simulation module connected to the first voltage-current probe and arranged to solve, based on measurements transmitted from the first voltage-current probe, a radio-frequency model of the radio-frequency transmission line between the first position and a second position located within the chamber.

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